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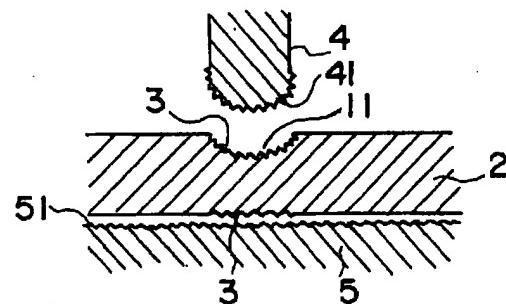
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(54)【発明の名称】 折り曲げ野線の付設方法

(57)【要約】

【構成】 野線刃4と受け台5との間にプラスチックシート2を挿入して凹溝11を形成するにあたり、野線刃4の刃先および/または受け台5の表面に小凹凸41、51を形成しておくことにより、前記凹溝内面および/または該凹溝の裏面に微小凹凸3を形成することを特徴とする折り曲げ野線1の付設方法。

【効果】 折り曲げ野線1を形成すると同時に、折り曲げ野線1を構成する凹溝11内面および/または該凹溝11の裏面に微小凹凸3を形成することができるとともに、折り曲げ応力がこの微小凹凸3に吸収されて折り曲げ易く、人形ケースや折り箱を組立てる際に折り曲げ角度が正確になり組立て後の平面性が良好となる。



## 【特許請求の範囲】

【請求項1】 野線刃と受け台との間でプラスチックシートを挿圧して凹溝を形成するにあたり、野線刃の刃先および／または受け台の表面に小凹凸を形成しておくことにより、前記凹溝内面および／または該凹溝の裏面に微小凹凸を形成することを特徴とする折り曲げ野線の付設方法。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明はプラスチックシートに折り曲げ野線を付設する方法に関する。 10

## 【0002】

【従来の技術】 プラスチックシートを折り曲げ加工し、人形ケース、包装容器等に加工する場合、折り曲げ野線を付設してこれに沿って折り曲げ加工する。従来の折り曲げ野線入りプラスチックシートに形成する折り曲げ野線は図4に部分断面図を示すように、たとえばプラスチックシート2の厚み方向に凹ませた凹溝11を形成して折り曲げ易くしたもの等があったが、この折り曲げ野線1に沿った表面は表裏とも微視的にみれば平滑に仕上げたものであった。

## 【0003】

【発明が解決しようとする課題】 上記、従来の折り曲げ野線入りプラスチックシートは折り曲げ性がいまひとつ充分でなく、折り曲げ加工したときに所定角度に仕上がるなかったり、加工後の平面が残留応力により湾曲したりし易いという問題があった。

## 【0004】

【課題を解決するための手段】 本発明は、折り曲げ野線入りプラスチックシートの折り曲げ性を改良せんとしたものであり、その要旨は野線刃と受け台との間でプラスチックシートを挿圧して凹溝を形成するにあたり、野線刃の刃先および／または受け台の表面に小凹凸を形成しておくことにより、前記凹溝内面および／または該凹溝の裏面に微小凹凸を形成することを特徴とする折り曲げ野線の付設方法である。 30

【0005】 以下、本発明を添付図面に基づき説明する。図1は本発明の折り曲げ野線の付設方法により得られる折り曲げ野線入りプラスチックシートの一例を示す一部分の斜視図、図2は図1のII-II断面図および折り曲げ野線付設装置の一例を示す部分断面図、図3は本発明により得られる折り曲げ野線入りプラスチックシートの他の例を示す部分断面図であり、図4は従来の折り曲げ野線入りプラスチックシートの一例を示す部分断面図である。 40

【0006】 本発明は図2にしめすように、野線刃4と受け台5との間でプラスチックシート2を挿圧して凹溝11を形成するにあたり、野線刃4の刃先および／または受け台5の表面に小凹凸41、51を形成しておくことにより、前記凹溝内面および／または該凹溝の裏面に微小凹凸を形成することを特徴とする折り曲げ野線の付設方法であるので、折り曲げ野線を形成すると同時に、折り曲げ野線を構成する凹溝内面および／または該凹溝の裏面に微小凹凸を形成することができるとともに、折り曲げ応力がこの微小凹凸に吸収されて折り曲げ易く、人形ケースや折り箱を組立てる際に折り曲げ角度が正確になり組立て後の平面性が良好となる。

【図面の簡単な説明】  
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微小凹凸3を形成することを特徴とする折り曲げ野線1の付設方法である。

【0007】 本発明によれば図1乃至図3に示すように折り曲げ野線1に沿ったプラスチックシート2の表面に微小凹凸3を、折り曲げ野線1を形成すると同時に、形成することができる。

【0008】 プラスチックシート2としては、ポリ塩化ビニル、ポリプロピレン等の硬質シートを用いることができる。

【0009】 折り曲げ野線1はたとえば図1、図2に示すようにプラスチックシート2の一面に凹溝11を設けてなるもの、あるいは図3のように折り曲げ野線1の範囲を小さな湾曲状の断面形状としたもの、さらに図示しないが複数の凹溝を一面あるいは両面に並設したもの等適宜の形状が使用できる。

【0010】 微小凹凸3は要するに折り曲げ野線1の断面の幅内に多数の凹凸が小さるようすればよいが、一般的に凹または凸の幅が5～100ミクロン、深さ（高さ）が5～100ミクロン程度が好ましい。幅あるいは深さ（高さ）が5ミクロンより小さいと効果が薄く、100ミクロンを越えると外観上悪影響が出てくる。 20

【0011】 微小凹凸3を設ける位置は、折り曲げ野線1に沿ったプラスチックシート2の表面であればよく、図1、図2に示すように折り曲げ野線1の両面に設けても、図3に示すように片面のみに設けてもよい。

【0012】 この微小凹凸3が、折り曲げの応力を分散吸収することにより、折り曲げ性が改良されるものと考えられる。

【0013】 本発明の折り曲げ野線の付設方法では、たとえば図2に示すように刃先に小凹凸41を形成した野線刃4と、表面に小凹凸51を形成した受け台5との間でプラスチックシート2を挿圧することによりプラスチックシート2の一面に凹溝11が形成され、さらに凹溝11内面とその裏面に微小凹凸3が形成された図1に示す折り曲げ野線1を有するプラスチックシート2が得られる。

## 【0014】

【発明の効果】 本発明は野線刃と受け台との間でプラスチックシートを挿圧して凹溝を形成するにあたり、野線刃の刃先および／または受け台の表面に小凹凸を形成しておこことにより、前記凹溝内面および／または該凹溝の裏面に微小凹凸を形成することを特徴とする折り曲げ野線の付設方法であるので、折り曲げ野線を形成すると同時に、折り曲げ野線を構成する凹溝内面および／または該凹溝の裏面に微小凹凸を形成することができるとともに、折り曲げ応力がこの微小凹凸に吸収されて折り曲げ易く、人形ケースや折り箱を組立てる際に折り曲げ角度が正確になり組立て後の平面性が良好となる。

## 【図面の簡単な説明】

50 【図1】 本発明の折り曲げ野線の付設方法により得られ

3

る折り曲げ野線入りプラスチックシートの一例を示す一  
部分の斜視図

【図2】図1のII-II断面図および折り曲げ野線付設装  
置の一例を示す部分断面図

【図3】本発明により得られる折り曲げ野線入りプラス  
チックシートの他の例を示す部分断面図

【図4】従来の折り曲げ野線入りプラスチックシートの  
一例を示す部分断面図

【符号の説明】

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4

\* 1 折り曲げ野線

1 1 凹溝

2 プラスチックシート

3 微小凹凸

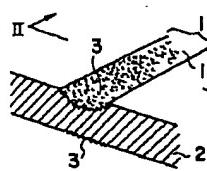
4 野線刃

4 1 小凹凸

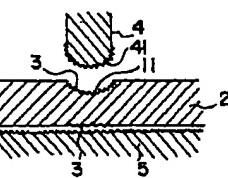
5 受け台

5 1 小凹凸

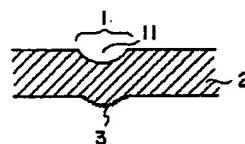
【図1】



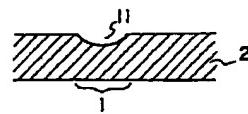
【図2】



【図3】



【図4】



# PATENT ABSTRACTS OF JAPAN

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(21)Application number : 05-160834

(71)Applicant : MITSUBISHI PLASTICS IND LTD

(22)Date of filing : 30.06.1993

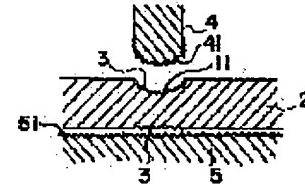
(72)Inventor : HASHIMOTO TADASHI

## (54) METHOD FOR FORMING SCORE FOR FOLDING

### (57)Abstract:

**PURPOSE:** To fold a sheet at an accurate angle to make up a doll case or small box with a good surface flatness by a method wherein grooves and ridges are formed on the tip of a scoring edge and/or the surface of a support to form small grooves and ridges on the inner surface of a score of the sheet and the opposite side of the sheet from the score in order to absorb the folding stress and make the folding easy.

**CONSTITUTION:** A hard plastic sheet 2 such as made of polyvinyl chloride and polypropylene is pressed between a scoring edge 4 and a support 5 to form a score 11 on the plastic sheet. During this time, since small grooves and ridges 41 and 51 are preformed on the tip of the scoring edge 4 and/or the surface of the support 5, small grooves and ridges 3 are formed in the inner surface of the score of the plastic sheet and/or the opposite side of the sheet from the score. Although a large number of the grooves and ridges 3 may be formed widthwise in the cross section of the score 11, it is generally preferable that the width and depth of the groove or ridge be about 5-100 microns.



### LEGAL STATUS

[Date of request for examination] 30.06.1993

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[Date of final disposal for application]

[Patent number] 1940990

[Date of registration] 23.06.1995

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right] 07.09.1997

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**CLAIMS**

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[Claim(s)]

[Claim 1] The attachment approach of the bending ruled line characterized by forming minute irregularity in said concave inside and/or the rear face of this concave by forming small irregularity in the edge of a blade of a ruled line cutting edge, and/or the front face of a cradle in forming \*\*\*\*\* for a sheet plastic between a ruled line cutting edge and a cradle.

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[Translation done.]

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## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the approach of bending to a sheet plastic and attaching a ruled line.

[0002]

[Description of the Prior Art] When bending and processing a sheet plastic and processing it into a doll case, a container, etc., it meets being attached, and a bending ruled line is bent and processed. The bending ruled line formed in the conventional sheet plastic containing a bending ruled line had the thing which made it easy to form the concave 11 dented in the thickness direction of a sheet plastic 2, and to bend, as a fragmentary sectional view was shown in drawing 4 , but the front face which met this bending ruled line 1 was finished flat and smooth, when regarding it also as the front flesh side microscopically.

[0003]

[Problem(s) to be Solved by the Invention] the above and the conventional sheet plastic containing a bending ruled line -- bending nature -- it is -- a parasisis convex -- there was a problem that are not finished at a predetermined include angle when it is not enough, and it bends and is processed, or the flat surface after processing tends to curve with residual stress.

[0004]

[Means for Solving the Problem] It is the attachment approach of the bending ruled line characterized by forming minute irregularity in said concave inside and/or the rear face of this concave by this invention's improving the bending nature of the sheet plastic containing a bending ruled line, and forming small irregularity in the edge of a blade of a ruled line cutting edge, and/or the front face of a cradle, when the summary forms \*\*\*\*\* for a sheet plastic between a ruled line cutting edge and a cradle.

[0005] Hereafter, this invention is explained based on an accompanying drawing. Some perspective views showing an example of the sheet plastic containing a bending ruled line from which drawing 1 is obtained by the attachment approach of the bending ruled line of this invention, the fragmentary sectional view in which drawing 2 shows the II-II sectional view of drawing 1 and an example of bending ruled line attachment equipment, and drawing 3 are the fragmentary sectional views showing other examples of the sheet plastic containing a bending ruled line obtained by this invention, and drawing 4 is the fragmentary sectional view showing an example of the conventional sheet plastic containing a bending ruled line.

[0006] It is the attachment approach of the bending ruled line 1 characterized by this invention forming the minute irregularity 3 in said concave inside and/or the rear face of this concave by forming the small irregularity 41 and 51 in the edge of a blade of the ruled line cutting edge 4, and/or the front face of a cradle 5 in forming \*\*\*\*\* 11 for a sheet plastic 2 between the ruled line cutting edge 4 and a cradle 5 so that it may be shown in drawing 2 .

[0007] According to this invention, the minute irregularity 3 can be formed in the front face of the sheet plastic 2 which bent as shown in drawing 1 thru/or drawing 3 , and met the ruled line 1 while forming the bending ruled line 1.

[0008] Hard sheets, such as a polyvinyl chloride and polypropylene, can be used as a sheet

plastic 2.

[0009] The bending ruled line 1 can use proper configurations, such as drawing 1 , a thing which forms a concave 11 in the whole surface of a sheet plastic 2, and becomes it as shown in drawing 2 or a thing which bent like drawing 3 and made the range of a ruled line 1 the cross-section configuration of the small letter of a curve, and a thing which installed two or more concaves in the whole surface or both sides side by side, although not illustrated further.

[0010] the minute irregularity 3 — in short — bending — the inside of the width of face of the cross section of a ruled line 1 — much irregularity — small \*\*\*\* — although what is necessary is just to make it like, generally about 5-100 microns has [ the width of face of concave or a convex ] 5-100 microns and the desirable depth (height). If effectiveness is thin when width of face or the depth (height) is smaller than 5 microns, and 100 microns is exceeded, an exterior bad influence will come out.

[0011] Even if it bends the location in which the minute irregularity 3 is formed that what is necessary is just the front face of the sheet plastic 2 which met the bending ruled line 1 as shown in drawing 1 and drawing 2 , and it establishes it in both sides of a ruled line 1, as shown in drawing 3 , it may be established only in one side.

[0012] This minute irregularity 3 is considered that bending nature is improved by carrying out distributed absorption of the stress of bending.

[0013] By the attachment approach of the bending ruled line of this invention, the sheet plastic 2 which has the bending ruled line 1 shown in drawing 1 by which the concave 11 was formed in the whole surface of a sheet plastic 2 by \*\*\*\*(ing) a sheet plastic 2 between the ruled line cutting edge 4 which formed the small irregularity 41 in the edge of a blade, and the cradle 5 in which the small irregularity 51 was formed on the front face as shown, for example in drawing 2 , and the minute irregularity 3 was further formed in concave 11 inside and its rear face is obtained.

[0014]

[Effect of the Invention] In forming \*\*\*\*\* for a sheet plastic between a ruled line cutting edge and a cradle, this invention by forming small irregularity in the edge of a blade of a ruled line cutting edge, and/or the front face of a cradle Since it is the attachment approach of the bending ruled line characterized by forming minute irregularity in said concave inside and/or the rear face of this concave While forming a bending ruled line and being able to form minute irregularity in the concave inside which constitutes a bending ruled line, and/or the rear face of this concave It bends, in case bending stress is absorbed by this minute irregularity, and it is easy to bend it and it assembles a doll case and a chip box box, and an include angle becomes exact and the smoothness after an assembly becomes good.

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[Translation done.]

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**TECHNICAL FIELD**

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[Industrial Application] This invention relates to the approach of bending to a sheet plastic and attaching a ruled line.

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[Translation done.]

## PRIOR ART

[Description of the Prior Art] When bending and processing a sheet plastic and processing it into a doll case, a container, etc., it meets being attached, and a bending ruled line is bent and processed. The bending ruled line formed in the conventional sheet plastic containing a bending ruled line had the thing which made it easy to form the concave 11 dented in the thickness direction of a sheet plastic 2, and to bend, as a fragmentary sectional view was shown in drawing 4 , but the front face which met this bending ruled line 1 was finished flat and smooth, when regarding it also as the front flesh side microscopically.

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**EFFECT OF THE INVENTION**

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[Effect of the Invention] In forming \*\*\*\*\* for a sheet plastic between a ruled line cutting edge and a cradle, small irregularity is formed in the edge of a blade of a ruled line cutting edge, and/or the front face of a cradle in this invention. Therefore, since it is the attachment approach of the bending ruled line characterized by forming minute irregularity in said concave inside and/or the rear face of this concave While forming a bending ruled line and being able to form minute irregularity in the concave inside which constitutes a bending ruled line, and/or the rear face of this concave It bends, in case bending stress is absorbed by this minute irregularity, and it is easy to bend it and it assembles a doll case and a chip box box, and an include angle becomes exact and the smoothness after an assembly becomes good.

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[Translation done.]

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## TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] the above and the conventional sheet plastic containing a bending ruled line — bending nature — it is — a paralysis convex — there was a problem that are not finished at a predetermined include angle when it is not enough, and it bends and is processed, or the flat surface after processing tends to curve with residual stress.

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## MEANS

[Means for Solving the Problem] It is the attachment approach of the bending ruled line characterized by forming minute irregularity in said concave inside and/or the rear face of this concave by this invention's improving the bending nature of the sheet plastic containing a bending ruled line, and forming small irregularity in the edge of a blade of a ruled line cutting edge, and/or the front face of a cradle, when the summary forms \*\*\*\*\* for a sheet plastic between a ruled line cutting edge and a cradle.

[0005] Hereafter, this invention is explained based on an accompanying drawing. Some perspective views showing an example of the sheet plastic containing a bending ruled line from which drawing 1 is obtained by the attachment approach of the bending ruled line of this invention, the fragmentary sectional view in which drawing 2 shows the II-II sectional view of drawing 1 and an example of bending ruled line attachment equipment, and drawing 3 are the fragmentary sectional views showing other examples of the sheet plastic containing a bending ruled line obtained by this invention, and drawing 4 is the fragmentary sectional view showing an example of the conventional sheet plastic containing a bending ruled line.

[0006] It is the attachment approach of the bending ruled line 1 characterized by this invention forming the minute irregularity 3 in said concave inside and/or the rear face of this concave by forming the small irregularity 41 and 51 in the edge of a blade of the ruled line cutting edge 4, and/or the front face of a cradle 5 in forming \*\*\*\*\* 11 for a sheet plastic 2 between the ruled line cutting edge 4 and a cradle 5 so that it may be shown in drawing 2.

[0007] According to this invention, the minute irregularity 3 can be formed in the front face of the sheet plastic 2 which bent as shown in drawing 1 thru/or drawing 3, and met the ruled line 1 while forming the bending ruled line 1.

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[Translation done.]

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] Some perspective views showing an example of the sheet plastic containing a bending ruled line obtained by the attachment approach of the bending ruled line of this invention

[Drawing 2] The fragmentary sectional view showing the II-II sectional view of drawing 1, and an example of bending ruled line attachment equipment

[Drawing 3] The fragmentary sectional view showing other examples of the sheet plastic containing a bending ruled line obtained by this invention

[Drawing 4] The fragmentary sectional view showing an example of the conventional sheet plastic containing a bending ruled line

[Description of Notations]

1 Bending Ruled Line

11 Concave

2 Sheet Plastic

3 Minute Irregularity

4 Ruled Line Cutting Edge

41 Small Irregularity

5 Cradle

51 Small Irregularity

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[Translation done.]